National Nuclear Security Administration

Fact Sheet

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Reliable Replacement Warhead Program

RRW will allow the United States to safely and securely maintain its nuclear weapons deterrent into the future with a reduced likelihood of nuclear testing

The Reliable Replacement Warhead (RRW) is a redesigned nuclear warhead that will allow the Department of Energy's National Nuclear Security Administration (NNSA) to achieve President Bush's vision of providing a credible nuclear deterrent with the smallest nuclear weapons stockpile needed for national security purposes. RRW will:

- **Assure long-term confidence in the reliability of the nuclear weapons stockpile**
  - Today's nuclear weapons stockpile is safe and reliable. However, the warheads are aging and are on average over 20 years old. The stockpile was largely designed and built during the Cold War.
  - If warheads are continually extended beyond their intended lifetimes, confidence in their reliability and performance will erode over the long-term. This is because small changes accumulate during refurbishments that take a weapon farther away from the original designs that were confirmed by underground nuclear testing.
  - Designs are no longer constrained by Cold War weapon's requirements, such as strict restrictions on size and weight. RRW will be designed with changes, such as added or different materials, that will maintain confidence in the reliability of the stockpile over the long-term.

- **Enhance security and prevent unauthorized use**
  - Making use of the best security technology is essential in a post 9-11 threat environment. RRW's design takes advantage of state-of-the-art, modern security technology to prevent use by terrorists.
  - Security features in the current stockpile use outdated technologies that were available during the Cold War years.
  - RRW will employ significant enhancements in security that are not available through the current process to extend the life of a weapon.

- **Improve the safety of the nuclear weapons stockpile**
  - For the first time, NNSA's production facilities participated fully during the RRW design phase in order to offer expertise on components and materials that are safer, and parts that are easier to maintain and manufacture.
  - Insensitive high explosives, which are less susceptible to accidental detonation, will be used in RRW to replace conventional high explosives.
  - RRW eliminates the use of certain hazardous materials, such as beryllium, that are harmful to people and the environment. Reducing hazardous waste will also improve efficiency and reduce costs.

- **Help to develop a nuclear weapons infrastructure that is more responsive to future national security needs**
  - A responsive infrastructure means having research, development and production facilities that are capable of reacting quickly to technical problems or national security threats.
  - The manufacturing and production of RRW will be simplified and more efficient by replacing hazardous and brittle materials, eliminating process steps, and eliminating expensive specialty materials.
  - RRW components will be designed for ease of assembly and disassembly, making them easier to maintain and to dismantle.

- **Enable a reduced stockpile size**
  - RRW will allow a responsive infrastructure that will provide opportunities to further reduce the number of spare warheads and meet the President's vision of the smallest stockpile consistent with our nation's security needs.
  - The ability to produce weapons more efficiently with RRW will permit NNSA to devote additional resources to warhead dismantlements.
  - RRW is consistent with U.S. nonproliferation commitments because it will allow for further stockpile reductions.

- **Decrease the likelihood that an underground nuclear test will be needed**
  - RRW will not need underground nuclear testing to confirm its performance. Instead, RRW will use modern manufacturing methods, improved analytical tools, and other non-nuclear tests, all part of NNSA's Stockpile Stewardship Program. This includes advanced supercomputer simulation and sophisticated experimental capabilities that have dramatically improved NNSA's understanding of the physics of nuclear weapons.
  - The pool of knowledge gained with these stockpile stewardship tools was used to specifically design RRW so that underground nuclear testing will not be needed.
  - RRW will be less sensitive to aging effects, making nuclear tests unlikely.
  - The RRW design is firmly rooted in the past nuclear test data base.

- **Utilize and sustain critical nuclear weapons design and skills**
  - World-class nuclear scientists and engineers are an extremely important national security asset. RRW gives the declining number of these specialists who honed their skills on underground nuclear testing an opportunity to transfer their specific knowledge to the next generation of scientists.
  - RRW will utilize the entire complex, including scientists from all three laboratories and engineers and technicians at the production facilities.